

## REMARKS

The Examiner maintains the rejection of claims 1, 3 and 4 under 35 U.S.C. 103(a) as being unpatentable over Poduska in view of Alappat et al and Wells et al ('840); and the rejection of claim 2 further in view of Cole.

Poduska uses dithering of pixel intensity values to prevent a phenomenon known as "banding" which occurs when there is a sharp contrast in adjacent pixel intensity levels. Specifically Poduska teaches (lines 26-39, column 2) "generating images by means of dithering" where "dithering is a technique used to 'smooth out' the junction between various **intensity** levels displayed in the output image of a device . . . [S]pecifically, dithering prevents the appearance of a sharp contrast between two different **intensity** levels which are positioned adjacent to one another, a phenomenon commonly called '**banding**'" so that "the contrast between two adjacent **intensity** levels appears less drastic to the human eye as a result of dithering and gives the image an overall appearance of having a greater resolution" (emphasis added), i.e., this is a contrast reduction technique. When generating an image having fewer intensity bits per pixel from an image having greater intensity bits per pixel, the number of intensity bits for the lower resolution image is treated as an integer portion for the higher resolution image, while the remaining intensity bits (LSB) of the higher resolution image are treated as fractional bits for the lower resolution image. A dither signal equal in bits to the fractional bits is added to the fractional bits portion of each pixel intensity value of the lower resolution image, with the resulting integer bits portion being the new pixel intensity value in the low resolution image. This addresses a completely different problem from that

addressed by Applicants' invention, as Applicant addresses the problem when a waveform image is reduced in size which causes apparent discontinuities, i.e., jaggies, in position (as opposed to intensity level) of adjacent pixels that define the line of the waveform (see Fig. 4a).

Alappat addresses the situation when a waveform is generated as vectors between discrete sample points in a raster image. In order to achieve an apparent smooth line for the waveform, Alappat defines a vector between two consecutive sample points and then illuminates pixels along an ideal vector with an intensity that is determined by the distance of the center of the pixel from the ideal vector. Again Alappat does not address the issue of jaggies that occur because of reducing the size of a waveform image. Also, like Poduska, Alappat adjusts pixel intensity values, and not pixel placement values.

Applicants' claims 1 and 4 recite generating a *shaped* dither signal, and then summing the shaped dither signal with a ***dimensional*** component value of each data point (emphasis added), i.e., the x or y pixel location value for the high resolution waveform image as opposed to the intensity level of the pixel. The data point dimensional component values are then subsampled to produce the lower resolution (down-sized) waveform image for display. Combining Alappat with Poduska would mean generating a waveform image using the Alappat vector rasterizing technique and then reducing the contrast using the Poduska technique. For a waveform display reducing the contrast is not desirable. There is nothing in this combination that dithers dimensional component values of the pixels, only intensity values. Therefore this combination neither teaches nor suggests to one of ordinary skill in the art the invention as claimed by Applicants in claims 1 and 4.

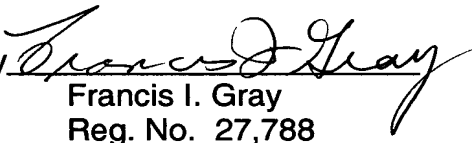
Wells adds nothing further, as it also only dithers pixel intensity levels, not dimensional component values. Thus claims 1 and 4 are deemed to be allowable as being nonobvious to one of ordinary skill in the art over Poduska in view of Alappat and Wells.

Claims 2 and 3, dependent from claim 1 also are deemed to be allowable as depending from allowable base claims and reciting substantial additional limitations.

In view of the foregoing argument allowance of claims 1-4 is urged, and such action and the issuance of this case are requested.

Respectfully submitted,

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